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NOTES

OF A

DIABETIC CASE.

On the 16th October, 1796, Captain M. was examined, and the following hiſtory comprehends the preſent ſtate of his diſeaſe, and a retroſpect of its origin and progreſs.

Preſent State of the Diſeaſe.

He voids about twelve quarts of urine in twenty-four hours; ſince laſt night has preſerved ſeven quart bottles, being the quantity made; it is of a light ſtraw colour, has no ſmell of urine, but has a whey and violet flavour, and its taſte is very ſweet.

His thirſt is exceſſive, and he drinks during the day ſeven or eight quarts, and even upwards; the tongue is whitiſh and moiſt; there is a clammineſs in the mouth, and he ſpits a white frothy ſaliva of a ſweetiſh taſte. His appetite for food is variable, ſometimes unuſually keen, and at odd times as in the night.

His ſkin is dry but not unuſually warm; pulſe rather weak and not exceeding eighty-four. His face fluſhed.

He is frequently ſick, and throws up matter of a viſcid nature, and of a bitteriſh and ſweetiſh taſte. After eating he has a pain of his ſtomach which continues often half an hour.

He has a conſtant pain in the region of both kidneys, extending forwards, but more particularly in the right, in which there ſeems to be a greater fullneſs and tenderneſs to the touch, and there is a retraction of the teſticle, with a weakneſs, ſenſe of coldneſs, and at night an œdematous ſwelling of the leg on the ſame ſide, with a pain and tenderneſs of the great toe. He feels a ſingular, painful, and fluttering ſenſation in his belly, extending from the ſituation of his kidneys.

He is regular in his bowels, though ſometimes inclining to coſtiveneſs; his ſtools are of a greeniſh colour, and have no unpleaſant ſmell.

The prepuce of the penis does not retract; it has a whitiſh appearance with excoriation and ſoreneſs, but is not ſwelled.

The gums are reddiſh and have the appearance as influenced by mercury, the teeth feel looſe to him, and as on edge, or the ſenſation from ſharp acids, and they are peculiarly white; he has loſt two of them. There is a fullneſs about the eyes, with a turbid yellowiſh caſt. He has ſlight and occaſional headachs.

His diet is animal food and vegetables; he has not been particularly reſtricted; he drinks from a pint to a bottle of port wine daily—other drink, toaſt and water. He uſes horſe and walking exerciſe, but cannot walk two miles without much fatigue.

Mr. Cruickſhanks (Ordnance Chemiſt, and a Surgeon of Artillery) took thirty-ſix ounces troy weight of urine voided to-day, and it yielded by evaporation three ounces and one drachm of a ſaccharine extract, of the appearance of molaſſes but thicker, having nearly the conſiſtence of wax, and like it tenacious. If therefore the whole of the day's urine had been evaporated it would have yielded about twenty-nine ounces troy weight, an aſtoniſhing quantity to be formed and ſeparated daily from the ſyſtem. By ſtanding in the air it became moiſt, and of nearly the conſiſtence, ſmell and appearance of treacle.

Treating ſome of this extract with the nitrous acid, he procured the ſaccharine or oxalic acid, and with a ſmaller proportion of the acid it produced a ſubſtance which in appearance, taſte and ſmell could not be diſtinguiſhed from honey.

The urine in appearance, taſte, ſpontaneous changes, and the reſult obtained by evaporation, may be conſidered as ſimilar to what has been obſerved by Dobſon and others, though there was leſs ſugar and more animal mucilage than in the diabetic urine of the former.

Two portions of blood of about four ounces each were taken on the 18th of October from the ſame vein, and at the ſame time: On ſtanding (in the inſide of a window fronting the north, the thermometer of Farh. in the air being fifty-five) the appearances reſembled exactly thoſe deſcribed by Dobſon, except that the ſerum did not impart a ſenſibly ſweet taſte; to me it taſted as whey with a greater than neceſſary proportion of rennet. The craſſamentum of the firſt cup had a ſlight buff, rather leſs ſerum than natural, and which was opaquely whitiſh; the craſſamentum of the ſecond cup had more of the buffy coat. The buffy coat in both cups was of a blueiſh colour, ſimilar to what mercury ſometimes produces.

On the ſame day a portion of healthy blood was taken and placed under the ſame circumſtances of temperature, &c. and in the ſame room with one of the portions of diabetic blood.

In two days the diabetic blood aſſumed a caſeous appearance on the ſurface, which diſappeared with the evaporation of the ſerum, and the whole maſs became dry and reſinous in appearance, without having undergone (unleſs the throwing out a ſlight animal ſmell for two or three days, with a mould on the ſurface of the craſſamentum be ſuppoſed marks of it) any apparent putrefactive proceſs, and on the 4th November, being ſixteen days from the operation, it remained in the ſame ſtate: whereas the healthy blood exhibited evident marks of great putrefaction in four ſour days, and was obliged to be thrown away on the ſeventh.

Retroſpect of the Origin and Progreſs of the Diſeaſe to its preſent State.

This diſeaſe has continued ſeven months and upwards. I ſaw the patient for a day or two in June, when the diſeaſe was detected. Previous to which, he had uſed nitre and ſmall doſes of mercury, but then the diſeaſe as diabetes had not been aſcertained. From June to the date of the preſent report, he had been living on the kind of diet deſcribed, and had taken ſome remedies under the direction of an eminent phyſician at Yarmouth, the principal of which were bark and alum. Occaſionally he found himſelf relieved, having leſs fever, and the quantity of urine being diminiſhed at one time to two or three quarts a day, but without any change in its ſenſible qualities. Sugar was alſo allowed during this treatment, and he took it in the form of treacle and ſpruce beer in conſiderable quantity, and the diſeaſe ſeemed to increaſe during its uſe.

He has fallen away in fat and fleſh conſiderably, and his muſcles are flabby. In October, 1794, when in apparent health, he weighed ſixteen ſtone and eight pounds, and in November, 1796, eleven ſtone eight pounds, ſhewing a loſs by the diſeaſe of no leſs than five ſtone in weight.

For the ſix months preceding the attack of the diſeaſe, he was ſick and vomited at leaſt two or three times a week, and he frequently brought up from the ſtomach during theſe vomitings different things which he had eaten ſeveral days before unaltered, and the taſte was generally ſour.

He always eat heartily and drank freely, but not intemperately, and was fond of high ſeaſoned and fat diſhes. He had had two regular attacks of gout, and had at other times two ſevere fits of cholic. He has been twice married, and has two children, the youngeſt of whom has been rickety. His age is thirty-four. Stature, five feet eleven inches and three quarters. Hair, light brown. Eyes, dark blue. Complexion, fair.

The Nature and Progreſs of the Diſeaſe, with its Treatment from the 16th October.

As the diſeaſe was evidently going on, and lately very rapidly, it was thought proper to adopt ſteps the reverſe of what had been purſued.

Two views of the diſeaſe preſented themſelves, the one as depending primarily on a changed proceſs of digeſtion, the other on a primary and peculiar action and condition of the kidneys.

Mr. Cruickſhanks, and Mr. Wittman (Surgeon of Artillery) having ſeen the patient with me, we agreed to meet on the evening of the 18th October, ſo as to form our view of the nature of the diſeaſe, and a correſponding treatment—to them I ſubmitted the following remarks, and which were founded on what had paſſed in ſeveral converſations we had from time to time on the ſubject.

1ſt, The ſtomach affection pointed out by the variation in the degree of appetite, and the ſenſation after eating; the ſtate of the digeſtion for ſix months previous to the actual appearance of the diſeaſe; the coſtive ſtate and the appearance of the ſtools; the taſte of the ſalivary diſcharge; the phenomena of the blood, and the waſting of the body, mark a general diſeaſe depending primarily on a changed and peculiar ſtate of the ſtomach, by which ſugar or matter poſſeſſing ſaccharine properties is copiouſly formed, and a defect of aſſimilation. The mere defect however of which will not account for the quantity of ſaccharine matter formed, though it certainly conſtitutes part of the nature of the diſeaſe. The exiſtence of ſuch a defect in the aſſimilating powers we apprehend is manifeſt from the quantity of animal, excluſive of ſaccharine matter voided with the urine, and from the waſting of fat and fleſh, having loſt five ſtone in weight by the diſeaſe.

2. The ſerum of the blood apparently containing leſs ſugar or ſaccharine matter than the urine, may depend on the power of the kidneys in ſeparating it in common with the other ſaline matters of the blood; but proving a new and peculiar ſtimulus their action is increaſed, and the ſugar conſequently ſeparated ſpeedily and in proportion to its formation in the ſtomach.

3. The buff on the blood, the white tongue, the thirſt and quickened pulſe, with the heat and dryneſs of the ſkin, and the fluſhed face, point out an increaſed action of ſome kind in the whole ſyſtem.

4. The painful ſtate of the kidneys, the feelings in the loins and belly, and of the right leg,

point out ſome morbid ſtate of the kidneys beſides a ſimple increaſe of action; indeed ſome change of ſtructure may be ſuppoſed from the mere increaſe of action and its long continuance, though the peculiar ſtimulus acting on them might be ſuppoſed to induce a morbid condition.

5. The quantity of urine diſcharged being greater than any quantity of liquids or ſolids received into the ſtomach, there may be a greater abſorption from the ſkin and lungs. The increaſed abſorption from the ſkin no doubt depends upon the great quantity of fluid ſeparated by the kidneys, and this ſecretion, as has been ſuggeſted in the 2d and 4th inferences, upon ſome peculiar ſtimulus applied to thoſe organs. The ſkin abſorption may therefore be conſidered as an effect, and an action of neceſſity. But excluſive of increaſed abſorption of mere fluid by the ſkin, it is ſuppoſed there may be ſomething peculiar abſorbed by the ſkin and lungs, and which may have a ſhare in maintaining the diſeaſe after it has been produced.

6. The objects of treatment therefore would be to deſtroy the ſugar or ſaccharine proceſs going on in the ſtomach, (by ſtomach is meant the

whole organs employed in digeſtion and aſſimilation) and to promote a healthy aſſimilation, and as auxiliaries to prevent the ſuppoſed increaſe of abſorption from the ſurface, to diminiſh the increaſed action and to change the imagined derangement of the kidneys.

The particular arrangement of the treatment as agreed upon, was as follows.

1*ſt*. The diet to conſiſt of animal food principally, and to be thus regulated.

Breakfaſt; One and half pint of milk, and half a pint of lime water, mixed together—bread and butter.

Noon; Plain blood puddings, made of blood and ſuet only.

Dinner; Game or old meats which have been long kept, and as the ſtomach may bear, fat and rancid old meats, as pork. To eat in moderation.

Supper; The ſame as breakfaſt.

2*dly*. A drachm of kali ſulphuratum to be diſſolved in four quarts of water which has been boiled, and to be uſed for daily drink.

No other article whatever, either eatable or drinkable, to be allowed than what has been ſtated.

A diet of animal food, eſpecially as rancid as poſſible, was propoſed with the view of preventing the formation of ſugar in the ſtomach, and by that means to remove the peculiar ſtimulus which ſupports the increaſed action of the kidneys. The kali ſulphuratum it was ſuppoſed would not only tend to diminiſh the too great action of the organs of digeſtion, but likewiſe chemically counteract the formation of ſugar, and thus act in concert with rancid animal food; but the hepatiſed ammonia, as will be afterwards deſcribed, we now prefer as the moſt active and certain medicine.

3dly. The ſkin to be anointed with hog's lard every morning. Flannel to be worn next the ſkin. The gentleſt exerciſe to be only permitted, but confinement to be preferred.

4thly. A draught at bed-time of twenty drops of tartariſed antimonial wine, and twenty-five of tincture of opium, and the quantities to be gradually increaſed. In reſerve as ſubſtances diminiſhing action, tobacco and foxglove.

5thly. An ulceration about the ſize of half a crown to be produced and maintained externally, and immediately oppoſite to each kidney. And,

6thly. A pill of equal parts aloes and ſoap to keep the bowels regularly open.

On the 19th October (when he was in the ſame ſtate as on the 16th) the patient had a copy of the plan of treatment, and which he commenced the ſame day, and was deſired to journalize as he went on.

So ſoon as the 21ſt ſome changes occurred; he made in the twenty-four hours only ſix quarts of urine, and drank only three quarts of the ſulphurated alkaline water; the urine was not ſo pale, had a cloud in it, and was more urinous in ſmell.

We think it neceſſary here to obſerve, that the blood-letting ſeemed to relieve the patient, as he felt the evening of the ſame day, according to his own expreſſions, lighter, cooler, and more chearful, and had leſs pain about the kidneys, and this was on the 18th, the day before the particular treatment was commenced. This circumſtance confirms our 3d inference of an increaſed general action.

Nov. 1.

The only alteration in the treatment ſince the 21ſt October, was in the occaſional uſe of ſulphur in place of the pills, and the kali ſulphuratum increaſed to two drachms daily. This day the quantity of urine did not exceed four quarts, and the urine was of a higher colour and more urinous ſmell; thirſt leſs; the drink not exceeding two quarts a day; ſkin moiſt and perſpires freely in the night; the ſtomach and belly are much leſs uneaſy, though he complains much of pain from the ulcerated parts in the loins; ſtools large and very offenſive.

Suppoſing that the quantity of alkaline ſalt he takes daily in the kali ſulphuratum, might have ſome improper effect on the kidneys, it was reſolved to try the hepatiſed ammonia (pure volatile alkali ſaturated with hepatic gas.—See Dr. Crawford's paper on muriated barytes, in the ſecond volume of the Medical Communications), a medicine propoſed by Mr. Cruickſhanks, and who was of opinion it might prove a more certain and active medicine than the other on the ſtomach, and in diminiſhing the action of the ſyſtem. He was to take five drops in each half pint tumbler of water as drink. He took the firſt day thirty-five drops at different times, and which in the evening produced ſickneſs and vomiting, with a giddineſs and drowſineſs. He threw up ſome apple pye which he had ſecretly eaten three days before. The apples and cruſt had not apparently undergone the ſlighteſt alteration. He was directed to leave off the hepatiſed ammonia for one day, and then to begin with two drops to each tumbler.

On the 4th he drank only three pints of water, and made only two quarts of urine, which to him and his ſervants (who had been in the habit of taſting his urine from curioſity) was not ſweet, and it depoſited a red, ſandy or lateritious ſediment.

On the 5th the opiate at bed-time was diſcontinued, and on the 8th the rubbing with the hog's lard was left off.

The unction with hog's lard being a troubleſome and diſagreeable part of the treatment, was diſcontinued as ſoon as a decided change took place in the urine, with the intention of renewing it again if neceſſary. It being now determined to ſimplify the procedure as much as poſſible, the parts deemed moſt eſſential were only to be retained, and theſe we conceived were confinement, animal food, and the hepatiſed ammonia.

The following reports marked with an aſteriſk are copied from the patient's own journal; but as they contain important intelligence, we ſhall occaſionally ſubjoin remarks to them.

Nov. 12*th*.

* Continued as before; the four drops of hepatiſed ammonia made me as uſually giddy, and having taken at different times ſixteen drops, my pulſe was only ſixty-ſeven movements in the minute; ſlept well; no ſtool; took my ſulphur with an increaſe of one tea ſpoonful; did not make quite two quarts of urine during the laſt twenty-four hours, but ſtill of the ſame paleneſs as yeſterday, though of a ſalt taſte and urinous ſmell.

13*th*.

* My urine ſtill of a pale colour, and rather inclined to a ſweet taſte, made during the twenty-four hours two quarts; drank five half pint tumblers of water, with four drops in each; ſlept

well; perſpired much; no ſtool; took two tea ſpoonfuls of ſulphur.

Note; on the 12th I took much exerciſe, I alſo drank ſome tea, and for ſupper eat a broiled kidney dreſſed with walnut catchup.

14*th.*

* Urine ſtill pale, but not quite ſo ſweet as yeſterday, made two quarts during the day and night; drank only four half pint tumblers of water, with four drops in each of the hepatiſed ammonia. Am deſired to leave off bread entirely; I drank ſome beer which I repeated on the 15th.

As the diſeaſe ſeemed to have been reproduced, an entire abſtinence from vegetable matter was directed on the 14th, but it appeared afterwards that he drank ſome beer on that day, and the day following. However on the 16th animal food was only taken, and which was to be continued without the ſmalleſt portion of vegetable matter, nothing to be allowed approaching nearer to it than milk, and even this was to be left off and ſtrong beef tea ſubſtituted, ſhould the diſeaſe not diſappear: and it was intended to try the effects of ſmall doſes of the oleum animale.

17*th*.

* Urine of a much higher colour, and its ſmell and taſte quite urinous; made only three pints and a half during the twenty-four hours; drank in the ſame time five half pints of water, with five drops of the hepatiſed ammonia in each, and which occaſioned me to be very ſleepy and giddy towards the evening, and at that time my pulſe was extremely weak, and only beat fifty movements in the minute. Had two ſtools.

Note; at one time during the afternoon, by accident, I took at leaſt fifteen or twenty drops of the hepatiſed ammonia at once, ſoon after which I was ſeized with extreme languor and giddineſs.

Thoſe reports * point out the influence of even a ſlight deviation from a proper diet and confinement in reproducing the diſeaſe, and tend to confirm the explanation given of its nature, and the effects of the hepatiſed ammonia as a powerful narcotic in certain ſtates of the ſyſtem.

But as it is evident the diſpoſition to the diſeaſe continues, and having a diminiſhed appetite, a pure bitter is therefore to be given with a view of aſſiſting the other parts of the treatment in changing the ſtate of the ſtomach. The removal of the diſpoſition muſt be finally accompliſhed by a long perſeverance in the means of cure.

From the 21ſt to the 24th November, he had ſickneſs and vomiting with gripings in his bowels, reſembling a common bilious attack, and for the production of which no reaſon could be aſſigned. He had an emetic of ipecacuan, and a doſe of caſtor oil. He threw up by the emetic an acid greeniſh matter, and the morning following the urine was evidently more urinous. The acid green matter thrown up after ſo long an uſe of a diet of entire animal food, ſhews the ſtrongeſt diſpoſition in the ſtomach to acidity. The preſent obſervation alſo points out, the probable advantage to be derived from changing the condition of the ſtomach, as well as emptying its contents, by the occaſional uſe of emetics. It has been obſerved, that after any unuſual commotion in the ſtomach and bowels the urine has always been more ſcanty and apparently more urinous the day immediately following. As the patient has ſhewn a diſlike to the ſulphur, caſtor oil is in future to be ſubſtituted when he has occaſion for ſuch a medicine.

Does not the effects of the hepatiſed ammonia, of emetics, and in ſhort of whatever induces ſickneſs or unpleaſant commotions in the ſtomach, ſhew forcibly the dependence of this diſeaſe on a condition of it very different from that of health? Do they not ſhew that ſuch a condition conſiſts in an increaſed morbid action of the ſtomach? The affirmative of thoſe queſtions is rendered ſtill more probable when we conſider the keenneſs and voracioufneſs of appetite the patient had, and the quickneſs of its returns. Can any thing be inferred from any ſuppoſed change in the condition of the gaſtric fluid? The peculiar nature of the gaſtric fluid is but little underſtood, it is known however to poſſeſs very active properties as is ſhewn by its effects on the dead ſtomach, and the experiments of Spalanzani, &c. and if theſe are admitted there can be no doubt, but that it is the moſt efficient fluid in the body, and may like other ſecretions be liable to morbid changes, producing ſingular and extraordinary effects, though at preſent altogether unknown.

We would on the whole ſay, that the cauſe of our diabetic diſeaſe, very probably conſiſted in the ſecretion of too great a quantity of the gaſtric fluid, with ſome alteration in its quality, and in too great an action of the muſcular fibres of the ſtomach, producing ſaccharine matter, and a certain defect in the powers of aſſimilation. And with this opinion we don't ſuppoſe the circumſtance of food being thrown up unaltered interferes, as the great quantity ſo frequently eaten prevented the ſtomach from getting quit of all its contents unchanged, eſpecially as it would no doubt act in preference on thoſe matters ſuiting its peculiar morbid condition. A ſpecies of indigeſtion however might be allowed, as in this diſeaſe we ſuppoſe digeſtion to be totally changed, from the reſults of the peculiar proceſs of the ſtomach being ſo entirely different from what uſually occurs. Though at the ſame time the action of the ſtomach be morbidly increaſed, the ſalutary products are not formed or applied.

Anorexy, as depending on dyſpepſy, has been alledged to conſiſt in a diminution of the muſcular action of the ſtomach, or in a vitiated ſtate of the gaſtric liquor, or in a deficiency of it. In anorexy, remedies weakening the tone of the ſtomach or ſyſtem in general always increaſe the diſeaſe ; the moſt ſucceſsful treatment being by remedies giving tone and action to the ſtomach. In our diſeaſe a keenneſs of appetite to voraciouſneſs has always attended, except during the mere temporary diſguſt ariſing from abſolute accumulation, and the changes for the better have been by thoſe remedies diminiſhing the action of the ſyſtem in general, and of the ſtomach in particular, as ſhewn by the effects of confinement, blood-letting, emetics and hepatiſed ammonia. At one time when the diſeaſe was apparently removed, there ſeemed to be, by the patient's narration, a tendency to anorexy, and on this account a bitter was given to prevent the ſtomach from running too ſpeedily into an oppoſite ſtate, likely to produce a new diſeaſe.

In the ſecond order of the claſs Locales, of Dr. Cullen's Noſological Arrangement, we find the diſeaſe termed Bulimia, and the character of the third idiopathic ſpecies of it is, Bulimia (emetica) cibum magna copia appetens, et mox per vomitum rejiciens. And this is the Bulimia Canina of Sauvage, who gives the only diſtinct, tho' conciſe deſcription of it we could find; there are however detached accounts of it in James's Medicinal Dictionary.

tionary. To both we beg leave to refer, as our preſent caſe bears a reſemblance to it; eſpecially in that part of it previous to the acceſſion of diabetes. In thoſe accounts of Bulimia nothing is mentioned with regard to urine. But the diſeaſe is ſaid to terminate fatally in atrophy, dropſy, &c. Sauvage ſays, the Bulimia Canina is owing to an acrimony of the digeſtive juices, and an irritability of the ſtomach. Abſorbents or alkalies, fat meats, oils, ſedatives and narcotics, are the remedies pointed out. Doctor James obſerves, that in Bulimia, "ſuch medicines as mightily relax and moiſten the ſtomach, and correct the acidity of the humour, have a peculiar virtue in taking off the ſenſe of hunger. Of this ſort are all pinguious, and oleaginous things; as fats, oils, and the extremities of animals. Thus Villanovanus relates, that a certain man affected with this diſorder, eat pot-bread dipt in lees of oil; and that a woman in the like caſe, drank twice the melted fat of beef, with a like quantity of hot oil; and that both theſe patients contracted ſo great a loathing of food, that neither of them eat any thing for five days, and ſo got rid of their diſtemper. Narcotics, by blunting the too exquiſite ſenſe of the ſtomach, have a virtue of moderating the Fames Canina."

Does not the Bulimia Canina reſemble in its nature not only the ſtate preceding the diabetic attack in our caſe, as we have related it; but alſo the diſeaſe itſelf?

Is it not probable that the urine of the Bulimia Canina would have been found ſweet, or having ſaccharine matter?

At any rate, the Bulimia ſhews an affection of the ſtomach very different from what is ſuppoſed in anorexy; and it approximates to the nature of our diſeaſe. And to us it is of importance as exhibiting a diſeaſe of the ſtomach depending on great irritability, and requiring narcotic remedies. It alſo ſuppoſes a changed ſtate of the gaſtric fluid, and a defect of the digeſtive proceſs, wanting abſorbents or alkalies, and food of the moſt highly animaliſed kind.

26*th*.

* Urine quite natural, and the quantity during the day and night not exceeding three half pints. My thirſt quite allayed, not having even the deſire to drink which I recollect to have had pre-

vious to the attack of the diabetes. Drank three wine glaſsfuls of an infuſion of quaſia with mineral alkali; and I feel in every reſpect, except that of weakneſs in my limbs, in good health.

A portion of this day's urine was examined; it was found high coloured, very urinous in ſmell, having a bitteriſh and ſaltiſh taſte without ſweetneſs, and depoſiting a ſlight gritty reddiſh ſediment. Mr. Wittman evaporated a portion of it, and he aſſured me no ſenſible ſaccharine matter was diſcoverable in the reſiduum, by either ſmell or taſte.

The daily accounts which follow are alſo from the patient's own journal, and ſhew the ſame circumſtances as thoſe related; but being if poſſible more diſtinct, and more ſtrongly corroborating our opinion of the nature of the diſeaſe, they are continued.

27*th*.

* Urine leſs in quantity than yeſterday by half a pint—did not make any urine during the night as uſual, made a half pint tumbler when I got up in the morning quite urinous. Drank during the twenty-four hours, two half pint tumblers of water, with

hepatiſed ammonia. Had a good ſtool. Continued the bitter.

28*th*.

* Made three pints of urine during this day and night. Drank in the ſame time two tumblers of water with hepatiſed ammonia. Had a good ſtool. I walked this day more than uſual, went down to the Warren and was weighed (the reſult of which has been already given). In my return home purchaſed ſome apples, and eat a large one. Continued the bitter.

29*th*.

* My urine increaſed to very near a quart, and of a paler colour, (a portion of this was evaporated, and it yielded a ſaccharine matter reſembling honey.) I went to London, drank ſome coffee, and eat a Shrewſbury cake, and returned to Woolwich to dinner. Drank two tumblers of water with hepatiſed ammonia. Had a good ſtool. One of the ſores on my loins healed up, the other healing.

It may be here remarked, that the progreſs of the caſe has juſtified our ſecond primary inference, namely, that the ſaccharine matter proved a new and peculiar ſtimulus to the kidneys, and increaſed their action. For it has appeared that the decreaſe of the quantity of urine has been in proportion to that of the ſaccharine matter, and hence a correſponding diminution of the action of the kidneys. But if, as we ſuggeſted in our fourth inference, a change of ſtructure in the kidneys of a nature different from mere enlargement of veſſels had taken place, perhaps the diminution of urine would not have been ſo ſpeedy and determined. It remains however ſtill to be aſcertained whether any peculiar condition of kidneys has been formed by the diſeaſe. So far as we have as yet gone, it does not appear probable.

Beſides the increaſe of kidney action from the ſaccharine matter, there may have been in our caſe an effect producing increaſe of action from ſympathetic affection with the ſtomach, and which effect is not unuſual in other caſes of diſeaſe, and it even occurs in health where the ſtomach is under the influence of a ſtimulus, as of wine.

30*th*.

* Made only one pint of urine during the day and night; its ſmell urinous, but of a paler

colour and rather of a ſweetiſh taſte. Walked as on the 28th. Drank two half pint tumblers of water with the drops. Continued my bitter. Eat an apple.

The patient was ſtrongly remonſtrated with, and he was told the conſequence of repeated deviations in probably fixing the diſpoſition to the diſeaſe ſo firmly as not only to increaſe the difficulty, but to eſtabliſh the impracticability of removing it. Fair promiſes were therefore renewed, and abſolute confinement to the houſe, entire animal food, and the hepatiſed ammonia as before, with the quaſia infuſion, were preſcribed and agreed upon. The urine continued pale though ſalt and of a urinous ſmell; but on Sunday the 4th December, the urine had a doubtful ſmell, and ſome of it was evaporated, and it yielded a reſiduum evidently ſaccharine, though much leſs ſo than in the firſt experiment, the urinous ſalts being now more predominant. We were in ſome difficulty—it was ſuggeſted that a portion of the apples might be ſtill in his ſtomach, as it had not been unuſual for him to throw up matters unaltered ſeveral days after they had been taken in. It was therefore reſolved to give him on the 5th an emetic.

On this being propoſed to him an averſion was ſignified, and he acknowledged having taken vegetable matter in bread and ſmall beer for the four days preceding. The emetic was however given in the evening, and the contents thrown up appeared to be chiefly what had been eaten the ſame day. So far the emetic marked a favourable change in the ſtate of digeſtion. It was now judged neceſſary to point out in ſtronger language the impropriety of ſuch deviations; and there is more reaſon to expect from the apparent reſult, that a correct ſteadineſs will be the conſequence.

Dec. 1ſt.

* Made one pint and a half of urine during the day and night; its taſte quite ſalt, but of a pale colour. Drank in the ſame time only one tumbler of water with four drops of the hepatiſed ammonia. Took my alkali in milk, and the bitter medicine. Had a good ſtool.

Eat hare for dinner with ſome of its ſtuffing, and which conſiſted of bread and parſley.

2d.

* Made the ſame quantity of urine, and which had the ſame colour and taſte as yeſterday. Eat

bread and cheeſe after dinner, and drank a tumbler of beer. Took the bitters and hepatiſed ammonia as uſual.

3d.

* The ſame quantity of urine, and of the ſame ſenſible qualities as yeſterday. I alſo eat bread and cheeſe and drank beer.

4th.

* Made a quart of urine of the ſame quality as yeſterday. I eat bread which had been ſoaked under roaſt mutton; I alſo eat bread and cheeſe, and drank two ſmall mugs of beer.

5th.

* My urine as yeſterday. Eat animal food only; and took an emetic of ipecacuan in the evening, which made me very ſick, and I brought up all I had eaten in the courſe of the day, and in the laſt puke the matter was very ſour.

6th.

* Urine ſince laſt night not exceeding a pint and a quarter, high coloured, very urinous in ſmell, and depoſiting a reddiſh ſand. Continued my bitter, alkali in milk, and the hepatiſed ammonia.

The ſour matter thrown up by the emetic ſhews the ſtrong diſpoſition in the ſtomach to acidity (ſee the remarks following the 17th November), and the high colour and depoſition in the urine ſhews probably the ſame thing, as it has been obſerved by others (Mr. Forbes on gout and gravel, and Dr. Wilſon on gravel and dyſpepſy) that ſuch high colour and depoſition was augmented if not produced by vegetable and acid diet, and that when ſourneſs prevailed ſenſibly in the ſtomach, the depoſition of ſandy matter was always more abundant; hence the formation of calculous complaints, and even gout has been explained as depending on a dyſpeptic ſtate of the ſtomach. I have been told however by one individual who may be depended on, that when he is ſenſible of acidity in his ſtomach, his urine is always clear, and depoſites no ſand or reddiſh ſediment.

The ſourneſs or acidity diſcoverable in our patient's ſtomach, after ſo long an uſe of animal food, points out a condition of the ſtomach unfavourable to the putrefaction of animal food. Doctor Fordyce ſays in his Eſſay on Digeſtion,

that

that in a ſtomach not in perfect force animal food will putrefy, although in a ſtomach in perfect force, not only putrefaction will not go on but will be even ſtopped, and the appearances of it deſtroyed. With a ſtomach therefore in perfect force, a Laplander may live on rein deer alone for the moſt part of the year without any portion of vegetable food. So may the inhabitants of Orange River, in Africa, on limpets, dead and putrid ſeals and whales, without taſting a particle of vegetable food excepting aromatics. And ſo might the inhabitants of this country live (as they did three centuries ago, at leaſt ſix months in the year) on animal food without any other vegetable ſubſtance than farinaceous matter. And all be exempted from ſcurvy, or any other detriment.

Nine ounces troy weight of this day's urine was evaporated by Mr. Cruickſhank, and it yielded (of a matter the ſame in conſiſtence as that of the experiment of the 16th October, but not ſo tenacious) five drachms, which was of a urinous ſmell and taſte, and did not impart any ſenſible impreſſion of the exiſtence of ſaccharine matter, and ſeemed to have very little difference in ſmell or appearance, except in being more tenacious from the reſiduum of nine ounces of my own urine, which weighed three drachms and a half, a quantity leſs than the other by one drachm and a half. If therefore we multiply our patient's urinary reſiduum of to-day by four, it gives two ounces and a half as the reſult of thirty-ſix ounces, which is five drachms leſs than was afforded by the ſame quantity of urine in the experiment of the 16th October, and of courſe approached more nearly to the amount of the reſiduum of healthy urine.

A portion of the reſiduum of our patient's urine and mine were ſeparately treated by Mr. Cruickſhank with nitrous acid; but the honey-like matter formed in the experiment of the 16th October was not produced; the reſults of both being very ſharply acid and bitter, and apparently containing nothing but phoſphoric ſalts, and nitrate of lime; though in examining afterwards the ſmall portions which remained after evaporation a little oxalic acid was detected in that of our patient; but this might have been produced by animal mucilage, and of courſe does not prove the preſence of ſaccharine matter or vegetable mucilage.

A portion of this reſiduum was treated in a different manner by being expoſed to heat in a coated retort. The products obtained were much carbonate of ammonia, a little animal oil, and what remained in the retort had every appearance of animal coal, being difficult to incinerate, and leaving nothing but a very ſmall quantity of the phoſphats of lime and ſoda. Had there been any quantity of vegetable mucilage, or ſugar, the ſyrupous or pyro-mucous acid would have been obtained, and the reſiduary coal afforded potaſh.

May not the high colour of our patient's urine, and its more urinous appearance this morning, depend on the operation of the emetic as well as on the correctneſs of eating yeſterday? For it has been obſerved during the diſeaſe that the urine was always more urinous after any derangement of the ſtomach, and does not this with all the other ſtriking phenomena which have been deſcribed as exiſting at the commencement of the treatment, or during its courſe, demonſtrate that the primary ſeat of the diſeaſe is in the organs of digeſtion and aſſimilation? We have avoided in theſe notes ſtating the opinion of others with regard to the nature and treatment of the diſeaſe as unneceſſary, leaving it to thoſe who favour them with an attentive peruſal and experimental trial, to determine how far the remarks we have propoſed are our own or otherwiſe; but we think it right here to ſay, that they have been formed by the mutual aid of Meſſrs. Cruickſhank and Wittman, and to the former, beſides the advantages of medical opinion, we refer the chemical experiments entirely.

We have alſo avoided as much as poſſible, except in very general terms, pathological reaſoning on the nature of this complaint, though it affords important points in phyſiological as well as pathological inveſtigation; for we feel the force of the impropriety of fixing opinions from one ſolitary caſe, however ſtrong and illuſtrative, and than which we preſume to alledge, there is not perhaps one inſtance of diſeaſe ſo ſtriking as ours on the records of medicine.

7*th*.

* Made no urine during this day, except about a wine glaſsful, nauſeouſly ſalt and urinous. By miſtake I took a greater number of drops of the hepatiſed ammonia, in a tumbler of water, than I was directed. The effect was inſtantateous, in producing a ſevere pain and ſhooting in my head, which continued for three hours. Doctor Rollo called about eight o'clock in the evening, when my headach was nearly gone; but my pulſe was only then ſixty in a minute. On going to bed, and on getting up in the morning of the 8*th*, I made urine, at both times the quantity did not exceed a pint and a half, was of a ſtrong urinous ſmell, high coloured, and depoſited a great quantity of ſandy matter.

My appetite is very good, and as my diet is confined to animal food, I never find myſelf ſatisfied after eating. I take my alkali, and bitter.

The patient's feeling of not being ſatisfied with what he eats, marking ſtill a degree of the ſtate of ſtomach which we have ſuppoſed to depend on increaſed ſecretion of the gaſtric fluid and muſcular action of the ſtomach, the bitter was directed to be diſcontinued, and not to be repeated unleſs ſymptoms of the oppoſite ſtate ariſe, a ſtate pointed out by anorexy.

Mr. Cruickſhank evaporated nine ounces of the urine voided laſt night and this morning, and it yielded of a browniſh reſiduum not tenacious, and of a highly urinous and animaliſed ſmell, three drachms, which is at the rate of one ounce and a half in thirty-ſix ounces of the urine, a difference of reſult when compared with that obtained from the ſame quantity of the urine of the 16th October, of one ounce and five drachms, and amounting to leſs than the weight of the reſiduum from the ſame quantity of my urine by two drachms,—the reſiduums had alſo as nearly as poſſible the ſame appearances.

Does not this great diminution of animal matter in the urine, when connected with the other changes marking the removal of the diſeaſe, ſhew that the aſſimilating powers are aſſuming, or have aſſumed a healthy action? This is rendered further probable, if not certain, by conſidering that the amount of animal and ſaline matter, formed and ſeparated in twenty-four hours, by this day's experiment does not exceed an ounce, whereas at firſt he was forming and ſeparating not leſs than twenty-nine ounces during the ſame time; and that from the increaſing fullneſs of countenance and firmneſs of fleſh generally, nutrition ſeems to be applied. It is intended to re-weigh him, and ſhould there be an increaſe of weight the fact will be eſtabliſhed.

8*th*.

* Made the laſt twenty-four hours one pint and a half of urine of the natural ſmell, taſte and colour, and without any of the ſandy like ſediment. (Does not the want of which mark a more healthy urine and condition of ſtomach ?) Continue the water and hepatiſed ammonia, and the alkali in my milk —the bitter has been laid aſide.

The excoriation and ſoreneſs of the penis is entirely gone, but the prepuce cannot be completely retracted. The gums have loſt their reddiſh appearance, and the teeth are firm and without the feel of being on edge. The penis affection was, previous to the treatment, occaſionally very troubleſome; it ſeems to have been owing to the very conſtant application of the ſaccharine matter, as it ceaſed gradually on its diſappearance. Both circumſtances, though apparently trifling, we hold to be of conſequence, as they aſſiſt in proving the abſence of the diſeaſe. But the ſtate of the mouth was conſidered of more importance than the other, as ſtrengthening the opinion of the diffuſion of the ſaccharine matter over the ſyſtem and its removal.

9*th*.

Two portions of blood of about three ounces each were taken at eleven this forenoon from the ſame vein, and in a free ſtream. They were examined at two P. M. and both were found to have an uniform maſs appearance. Each portion was covered with a very thin pellicle of coagulable lymph of a looſe texture, reſembling the white of an egg, and except which there was no other ſeparation of parts exhibited. But in order to aſcertain this more exactly, a penknife was plunged into different places of the portion in the ſecond cup, or that which was laſt drawn, and it was found throughout of a looſe texture, having no diſtinct ſeparation of craſſamentum and ſerum; indeed it appeared as one ſoft maſs: the red part was of a dark colour. It may be neceſſary to obſerve, that the cups were placed in a window fronting the north (the thermometer on the outſide of a window in ſuch an aſpect was at the ſame time to-day 27). The cups after the examination were removed to the chimney-piece over a good fire, to be re-examined in the evening.

From the appearance of the blood, we think it not improbable an oppoſite ſtate of ſyſtem is likely to occur; though the account of the gums and teeth deſcribed yeſterday don't point out any advance, yet the patient will be unremittingly watched. It may be alſo obſerved, that he felt very differently to-day after the blood-letting to what he did on the 18th October, then he became lighter and more chearful, whereas to-day he felt heavy and languid.

Nine o'clock P. M. re-examined the portions of blood—the ſurface of the blood in the ſecond cup was found to be of a florid red, the pellicle thicker and of a tougher conſiſtence, but without any further ſeparation of parts, all being in one apparent connected maſs. The portion of the blood firſt drawn, which was left untouched, was alſo found to be in an uniform maſs without any ſeparation of ſerum, the whole was however much firmer than at two o'clock, and the pellicle of coagulable lymph was thicker and tougher—the blood in both under the pellicles was very black. Therefore the cold may have had ſome influence, as the blood exhibited rather different appearances, though ſtill it might be ſaid to be in rather a diſſolved ſtate, and approaching to that of ſcurvy, the advance of which is rendered more probable by the languor following the operation. He is now however chearful, and ſatisfied his diſeaſe is removed. He has made no urine ſince the morning, nor has he any deſire to void any this evening. He is directed to leave off the alkali, and alſo the hepatiſed ammonia; and he is to be allowed to walk out to-morrow. In a few days he will be permitted to ride gently, and to eat bread, ſhould no circumſtance intervene to prevent it.

FROM the whole then of this caſe, at leaſt ſo far as it has proceeded, it is not unreaſonable to draw a favourable prognoſis; but as it now evidently depends on the patient's perſevering in a very reſtricted plan for the accompliſhment of a perfect cure, we may perhaps, from the experience of his inſtability, hold the iſſue to be ſtill doubtful. However, the ſuggeſted nature of the diſeaſe and the appropriated treatment, have by the reſult become ſo highly ſatisfactory, that it was thought expedient to make them known to thoſe who were likely to meet with the ſame complaint, in order that a further trial might be made without any loſs of time, and to ſolicit the reſult of ſuch trials. On our part promiſing an account of the final termination of the preſent caſe, or any further trials we may have an opportunity of proſecuting.

We beg leave here to add, that ſhould another caſe of Diabetes ſimilar to this again occur, we would try confinement and animal food only, and if theſe did not ſucceed, gradually adopt the other parts of the treatment purſued in the preſent caſe. We would commence, where the general action was ſtrong, by blood-letting, but in every inſtance by an emetic and a doſe of caſtor oil. In the preſent caſe we gave ipecacuan only; but perhaps the tartariſed antimony might be found preferable, as it induces a greater degree of nauſea, and its debilitating effects probably continue longer. From the narcotic, independent of any other effects of the hepatiſed ammonia on this diſeaſe, and of the quiet nights produced by opium, we have no doubt that other narcotics, and medicines diminiſhing action may prove of real utility under certain circumſtances of this diſeaſe. But the preference, for the reaſons formerly ſtated, is to be given to the hepatiſed ammonia. Perhaps camphor might be entitled to a trial. From the commencement of the treatment and during its progreſs, we would recommend the quantity of ſolids and liquids daily taken to be more accurately aſcertained than was done in the preſent caſe, in order to determine with more preciſion, by a compariſon with the urine and its contents, the changes going on in digeſtion and aſſimilation, and ſo aſcertain the return of thoſe which are healthful.

NOTES,

Miſcellaneous and Supplementary.

The hepatiſed ammonia has been given in a caſe of extreme irritability with a local ſore the product of the venereal diſeaſe and mercury with ſurpriſing good effect; alſo to the ſore hepatic gas was applied. This caſe was under the charge of Doctor Irwin, of the Artillery, who was very attentive to the exhibition. It has been alſo given in a caſe of pectoral complaint with advantage; and is likely to turn out a valuable medicine, of courſe the medical world will become greatly indebted to Mr. Cruickſhank.

Hepatiſed ammonia, is very eaſily prepared by making a ſtream of pure hepatic gas paſs through the aq: ammon. pur. (Ph. Lond.) until no further abſorption is perceived, or until the alkali is ſaturated. The hepatic or ſulphurated hydrogene gas ſhould be obtained for this purpoſe from artificial pyrites and the muriatic acid.

The doſe to an adult ſhould not at firſt exceed three or four drops, to be given three or four times a day, and the doſe to be gradually increaſed, ſo as to produce ſlight giddineſs; but as it is a very powerful and in large doſes a dangerous medicine, great caution ſhould be uſed in its exhibition—for the want of which our diabetic patient two or three times experienced much diſtreſs.

The oxygenated muriatic gas has been applied externally by a very ſimple contrivance, to ſores ariſing from morbid poiſon, and to ſloughing and ulcerating ſores unaccompanied with much pain and irratibility.

The carbonic acid gas has been alſo applied in the uſual caſes by the ſame ſimple means with good effect—and with the ſame advantage in like manner the hydrogene and hepatic gaſes have been applied to painful and irritable ſores.

The following is Mr. Cruickſhank's manner of applying them.

The apparatus for the purpoſe is very ſimple, and may be had of Mr. Blades, a very ingenious glaſs manufacturer on Ludgate-hill (the value about 7*s.* 6*d.*) It is nothing more than a proof with an improvement for introducing the acid at pleaſure, by means of a ſmall bottle with a ſtop-cock adapted to the proof in place of a common ſtopper. If a bladder with the bottom part cut off be faſtened to the extremity of the tube, we can apply the gas to any part, and for any length of time we pleaſe: for by turning the cock more acid can be introduced whenever the effervеſcence ceaſes, and conſequently the bladder be kept uniformly diſtended with the peculiar gas we wiſh to employ.

But the oxygenated muriatic gas is ſimply applied by moving the end of the glaſs tube over the ſore and without the bladder, as this gas can only be applied for a moment or two; indeed in this way it produces the effects deſired, namely, ſome chemical decompoſition, and a change of action in the part; for if longer continued it acts as a cauſtic and forms a ſlough.

The notes of the caſe of diabetes, the effects of hepatiſed ammonia in the caſe of irritability, and its favourable tendency in a pectoral complaint, with the good effects of different gaſes externally applied to ſores in this Hoſpital, exhibit facts in ſupport of the application of pneumatic chemiſtry to medicine.

For example, 1ſt. Our caſe of diabetic diſeaſe may be ſaid to have depended on a ſingular oxygenated ſtate of the ſyſtem, formed by a peculiar condition of the ſtomach, peculiar combinations in it, and perhaps partly maintained afterwards by a certain condition of ſkin and lungs. Hence the obvious remedies would be thoſe abſtracting oxygene from the ſyſtem, removing the peculiar condition of the ſtomach, and its peculiar combinations, and changing the condition of the ſkin and lungs. Breathing a lowered atmoſphere by confinement in a ſmall room, abſtinence from exerciſe, rubbing the ſkin with hog's lard, the uſe of a diet of animal food and as rancid as can be eaten, the internal exhibition of hepatiſed ammonia and narcotics, and we ſhould perhaps add the employment of emetics with the occaſional uſe of ſulphur and caſtor oil when requiſite, furniſh the particular remedies.

2nd. In the caſe of extreme irritability with local ſore, it was ſuppoſed to depend on a certain oxygenated ſtate the effects of mercury, and from the almoſt immediate healthy changes produced by the hepatiſed ammonia and hepatic gas, that ſuppoſition was rendered extremely probably.

As connected with the application of the new doctrines of chemiſtry to medicine we embrace this opportunity of diſperſing the knowledge of a fact illuſtrative of Doctor Trotter's idea of ſcurvy, a fact to which he is as yet a ſtranger, but it is expected it will now reach him.

The ſcurvy appeared among the convicts off Woolwich on board of veſſels moored in the Thames, about the 13th April, 1795, a diſeaſe which ſo far as I could learn, had not hitherto prevailed. The preceding winter was very ſevere, and the men were confined on board, as labour on ſhore was impracticable. Their diet conſiſted of boiled barley or oatmeal porridge for breakfaſt and ſupper; broth of ox-cheeks and ſhins of beef with a portion of the meat for dinner; a proper allowance of bread, and three pints of ſmall beer daily. They had had no freſh or recent vegetables from the 12th October, 1794, to the 24th April, 1795. The ſcurvy as has been ſtated began to appear about the 13th April. On the 3d July I viſited the ſhips with Mr. Hornſby, the Surgeon of the convicts, and Doctor Jameſon, of the Artillery, and we found only three men with any ſymptoms of ſcurvy remaining. The diſeaſe was ſoon checked, as recent vegetables were ſupplied eleven days after its appearance.

During that winter and when the convicts were not allowed to be on ſhore, they were moſtly kept on deck in the day-time, and the hatches and port-holes were daily open, and only ſhut when the weather abſolutely required it: there were however grates to the hatches and port-holes which were uſed in bad weather, and by this means a ſucceſſion of freſh air was always permitted.

In ſome of thoſe unfortunate perſons a depreſſed ſtate of mind, in all, cold, want of active exerciſe and recent vegetables were the only circumſtances which could be aſſigned as the cauſes of ſcurvy. But it is only the want of active exerciſe (perhaps principally and in which it may have been aſſiſted by the other circumſtances, producing a ſtomach of imperfect force, ſee the remarks under the 6th December), and freſh vegetables that appeared the immediate contributing cauſes, as the others had always prevailed in winter.

That the application of the new chemiſtry to medicine will in time prove of the greateſt advantage there is not the leaſt doubt. Not only the nature of diſeaſes, but their treatment will become more ſatisfactorily and ſucceſsfully illuſtrated. We are however of opinion, that the progreſs to its therapeutic perfection muſt be chiefly by attention to the ſtomach. The conveyance by the lungs pneumatically is a mode of difficulty, and perhaps of uncertain effect. The ſame may be ſaid of the ſkin, though probably in a certain way a more likely means of communication. By the ſtomach, by regimen generally the ſyſtem may be hyper-oxygenated, may be de-oxygenated, and may be confined to its neceſſary oxygenated ſtate. Our notes on the diabetic caſe illuſtrates this, but further trials and inveſtigations will more certainly confirm the remarks; we would therefore recommend, that the principal attention in the application of the doctrines of the new chemiſtry to the removal of diſeaſe ſhould be by the ſtomach, and general regimen. Time and induſtry will add to our preſent ſtock of agents. It is a great ſtep to be enabled to ſay, that by a mode of conduct we can, not only produce ſomething akin to ſcurvy, and affections of a directly oppoſite tendency, but alſo remove them—an advance of knowledge to which we have already arrived. Within this range of progreſs may be introduced the means of deſtroying contagion by the oxygenated muriatic acid gas. Mr. Cruickſhank in March, 1795, took two portions of recent ſmall pox matter from the ſame perſon, and expoſed one portion to the gas for a few minutes, and with it inoculated the left arms of three drummers, while the right arms were inoculated with ſome of the other portion. The punctures of the left arms had no marks of inflammation except what ſimple puncture produces, and they entirely diſappeared in a few days. But the right arms took on the variolous action, and in two of the perſons there was a general eruption. This experiment has been once repeated and with the ſame ſucceſs. In this Hoſpital, the oxygenated muriatic acid gas has been alſo uſed to deſtroy more general contagion, and not unfrequently the offenſive ſmell of ſores, &c. which it does very ſpeedily and effectually, and we have found that it can be managed with perfect eaſe and ſafety, and being cheaper as well as probably more efficacious than any other, we are inclined to give it the preference. This ſubject however will be on a future occaſion introduced and fully explained.

John Rollo, M. D.
Surgeon General Royal Artillery.

WOOLWICH,
Royal Artillery Hoſpital,
December 10, 1796.

POSTSCRIPT.

POSTSCRIPT.

CAPTAIN M. as has been related, left off the pure liquid alkali which he took in his milk; and alſo the hepatiſed ammonia on the 10th of December—he was likewiſe allowed to walk out, and which he continued to do until the 12th, when he was permitted to ride on horſeback, and no unfavourable change ariſing, but on the contrary decided marks of the removal of the diſeaſe, he was deſired on the 18th to eat half a pound of bread as a daily allowance, and to perſiſt in his exerciſe.

December 30th.—Since the 18th he has continued free of diſeaſe, and is now in high ſpirits and rapidly gaining fleſh; his urine does not exceed two pints, and it is often under that quantity in twenty-four hours, and perfectly urinous. To-day he weighed thirteen ſtone and one pound, which compared with the weight of the 28th November laſt, it will be found that he has gained one ſtone and a half, and which furniſhes a convincing proof not only of the removal of the diſeaſe, but we truſt of the diſpoſition to it. Cautious ſteps are however for ſome time to be purſued, and as our patient ſeems now fully ſenſible how much depends upon himſelf, we have reaſon to hope there will be no return of the complaint. He is adviſed to eat rather leſs animal food, and more bread, but no other alteration as yet to be permitted.

January 4th, 1797.—Captain M. continues free of complaint; but a more particular account of his progreſs from the 10th of December, and any ſubſequent narration from this date, which may be deemed neceſſary to continue and report, will be at a future period detailed. At the ſame time the deſultory notes (notes, written as they aroſe during the progreſs of the treatment) of the caſe, will be more diſtinctly connected and arranged; and from our preſent proſpects we truſt that we ſhall be able to give the reſults of more caſes of the diſeaſe, coming immediately under our own charge; beſides the expected reſults by others of caſes treated in our way, and which we again earneſtly ſolicit.

During the experiments on the diabetic urine, Mr. Cruickſhank was led to examine by analyſis more particularly than he had hitherto done the nature of ſugar. He has gone through a ſeries of experiments on the ſubject, but they are not ſo complete as to enable him to draw a ſatisfactory concluſion—however, in order that others may take up the ſubject, the following abſtract of the moſt important of the experiments he has already made are communicated.

1. Sugar by ſimple diſtillation was found to yield more pyro-mucous acid than gum, in the proportion of 132 to 117, and more charcoal in the proportion of 7 to 6 nearly.

2. When a ſolution of ſugar and water was mixed with the ~~ſul~~phosphuret of lime, in a jar inverted over mercury, a quantity of phoſphoric gas was produced, and after ſome days the ſugar was decompoſed, being deprived of its ſweetneſs, and converted into a ſubſtance in a great meaſure inſoluble in alcohol.

3. When a ſolution of ſugar was mixed with the ſulphuret of potaſh, and introduced into a veſſel excluded from the air, after ſome time it was deprived of its ſweetneſs, and converted into a ſubſtance inſoluble in alcohol, and having the appearance of gum—a ſomewhat ſimilar effect was produced by the hepatiſed ammonia and pure potaſh.

4. Sugar in ſolution introduced into a bottle filled with nitrous gas, after remaining for ſome days and being frequently agitated, was found to have an acid taſte, and the acid being ſaturated with an alkali no ſenſible taſte of ſugar could be perceived.

5. A quantity of the red oxyd of mercury was boiled for ſome time in a thick ſolution of ſugar, the oxyd gradually loſt its colour, became grey, and at laſt globules of mercury could be perceived. The liquor being filtered had a rough taſte, and ſhewed acid properties on the addition of tincture of litmus, a little potaſh being added, a precipitate of mercury in the form of a dark coloured powder took place.

From thoſe experiments it would appear that ſugar contains a larger proportion of oxygene than mucilage or gum, and whenever it is deprived of this exceſs it loſes its ſaccharine properties; that it contains a greater quantity of carbone; and that by the addition of a larger quantity of oxygene it is readily converted into an acid capable of diſſolving the oxyd of mercury.

From thoſe experiments may be alſo explained the reaſon of ſome of the good effects which were obſerved to follow the uſe in the diabetic caſe of the kali ſulphuratum and hepatiſed ammonia; and as ſugar contains ſuch a large proportion of oxygene it may be ſeen why animal food, eſpecially fats, and rancid meats, cannot readily be converted into that ſubſtance by the organs of digeſtion, and of courſe why, excluſive of any other ſuppoſed advantage, they are ſuitable to diabetic diſeaſe.

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